

Application Serial Number 10/743,628

Art Unit 2856

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1. (original) An apparatus for obtaining a representative sample from a fluid stream having an isothermal condition, comprising:

a heat pipe having first and second segments, a length, and a main cavity formed along its length;

a conduit having a central passage formed longitudinally therethrough, said conduit formed of thermally conductive material, said conduit situated in communication with said heat pipe;

said first segment of said heat pipe engaging said fluid stream, so as to thermally effect said main cavity of said heat pipe;

whereby sample fluid passing through said conduit from said fluid stream maintains an isothermal condition as it passes through said central passage of said conduit.

2. (original) The system assembly of claim 1, wherein there is further provided a plurality of heat pipes in longitudinal alignment.

3. (Previously amended) The system assembly of claim 1, wherein said conduit is integrated within said main cavity of said heat pipe.

4. (original) The system of claim 3, wherein said conduit is surrounded by working fluid and vapor within said main cavity of said heat pipe.

5. (original) The system of claim 1, wherein said heat pipe is integrated into a sample probe structure.

6. (Currently amended) The system of claim 5, wherein ~~the~~said sample probe has an external portion, said first segment of said heat pipe is in thermal sink with said fluid stream, and said second segment of said heat pipe thermally interfaces with said external portion of said sample probe, to offset ambient environmental temperature influence on the external portion of ~~said~~ the fluid sample probe.

7. (original) The system of claim 6, wherein there is further provided a phase separation membrane formed to remove liquid from a sample gas before entering said conduit.

8. (original) The system of claim 7, wherein said sample probe has first and second ends, and wherein said first end of said fluid sample probe is positioned internal to the fluid stream and a second end is positioned external to said fluid stream.

9. (Previously amended) The fluid sample probe of claim 6, wherein the heat pipe is formed within said sample probe structure.

10 - 23 (Cancelled)

24. (original) The method of obtaining a sample fluid having an isothermal condition from a fluid stream, comprising the steps of:

a. providing an apparatus, comprising:

a heat pipe having first and second segments, a length, and a main cavity formed along its length;

a conduit having a central passage formed longitudinally therethrough, said conduit formed of thermally conductive material, said conduit situated in communication

with said heat pipe;

said first segment of said heat pipe engaging said fluid stream, so as to thermally effect said main cavity of said heat pipe;

b. positioning said heat pipe to thermally engage said fluid stream such that said heat pipe develops an isothermal condition equivalent to said fluid stream;

c. allowing said thermally conductive material of said conduit to thermally engage said heat pipe such that said conduit develops an isothermal condition equivalent to said heat pipe;

d. directing a flow of sample fluid from said fluid stream into said conduit; and

e. retrieving said sample fluid from said conduit.

25-26 (Cancelled)

27. (Previously amended) An apparatus for obtaining a representative sample from a fluid stream having an isothermal condition, comprising:

a conduit having a central passage formed longitudinally therethrough, said conduit formed of thermally conductive material, said conduit having a portion situated exterior said fluid stream,

isothermal regulation means for maintaining said portion of said conduit exterior said fluid stream at an isothermal condition utilizing said isothermal condition of said fluid stream;

whereby sample fluid passing through said conduit from said fluid stream maintains an isothermal condition as it passes through said central passage of said

conduit.

28. (Previously amended) The apparatus of Claim 27, wherein said isothermal regulation means comprises a heat pipe.

29-31 (Cancelled)

32. (Previously amended) The method of obtaining a sample fluid having an isothermal condition from a fluid stream, comprising the steps of:

a. providing an apparatus, comprising:

a conduit having a central passage formed longitudinally therethrough and a length, said conduit formed of thermally conductive material, said conduit having a portion situated exterior said fluid stream ,

temperature regulation means for maintaining said conduit at said isothermal condition of said fluid stream;

b. allowing said thermally conductive material of said conduit to thermally engage said fluid stream such that said conduit develops an isothermal condition equivalent to said fluid stream;

c. directing a flow of sample fluid from said fluid stream into said conduit while allowing said temperature regulation means to thermally isolate said conduit from ambient temperature along said length of said conduit; and

d. retrieving said sample fluid from said conduit.

33. (Previously amended) The apparatus of Claim 1, wherein said sample fluid

passing through said conduit is isothermally regulated by a heat pipe so as to maintain said sample fluid at said isothermal condition of said fluid stream.

34.-35. (Cancelled)